Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (Previously Amended) A platform for use in sample analysis comprising an optically transparent substrate having a refractive index (n_1), a thin, optically transparent layer, formed on one surface of the substrate, said layer having a refractive index (n_2) which is greater than (n_1), said platform incorporating therein one or multiple corrugated structures, each comprising substantially parallel periodic grooves which define one or multiple sensing regions, said grooves being configured such that

coherent and linearly polarized light incident on said platform is diffracted into individual beams or diffraction orders which interfere resulting in a substantially total extinction of the transmitted beam and an abnormal high reflection of the incident light thereby generating an enhanced evanescent field at the surface of the one or multiple sensing regions;

wherein the enhanced evanescent field interacts with luminescent material on or in the vicinity of one or more of the sensing regions so as to produce a luminescent signal.

2. (Previously Amended) The platform of claim 1, wherein for each corrugated structure:

(a) the depth of the grooves is in the range of 3 nm to the thickness of the optically transparent layer,

(b) the thickness of the optically transparent layer is in the range of 30 to 1000 nm,

(c) the period of the corrugated structure is in the range of 200 to 1000 nm,

(d) the ratio of groove depth to the thickness of the optically transparent layer is in the range of 0.02 to 1, and

(e) the ratio of groove width to the period of the grooves is in the range of 0.2 to 0.8.

3. (Canceled)

4. (Original) A platform according to claim 1 wherein the substrate of the platform is formed from inorganic material.

5. (Original) A platform according to claim 1, wherein the substrate is formed from organic material.

6. (Original) A platform according to claim 1, wherein the optically transparent layer is formed from inorganic material.

7. (Original) A platform according to claim 1, wherein the optically transparent layer is formed from organic material.

8-9. (Canceled)

10. (Previously Amended) A platform according to claim 1, wherein the surface of the optically transparent layer includes one or a plurality of sensing regions, each of which carries one or plurality of capture elements.

11. (Previously Amended) A platform according to claim 10, wherein each capture element contains one or more capture molecules which are capable of affinity reactions.

12. (Original) A platform according to claim 10, including an adhesion promoting layer disposed at the surface of the optically transparent layer in order to enable immobilisation of capture molecules.

13. (Previously Amended) A platform according to claim 1, wherein the platform is formed with a plurality of sensing regions, each having its own diffractive grooves or multiple, superimposed grooves suitable for multicolor excitation and detection of samples.

14-31. (Canceled)

32. (Previously Presented) Apparatus for analysing samples comprising a platform including an optically transparent substrate having a refractive index (n_1), a thin, optically transparent layer, formed on one surface of the substrate, said layer having a refractive index (n_2) which is greater than (n_1), said platform incorporating therein one or multiple corrugated structures comprising periodic grooves which define one or multiple sensing regions, said grooves being configured such that either

a) coherent light incident on said platform is diffracted into individual beams or diffraction orders which interfere resulting in reduction of the transmitted beam and an abnormal high reflection of the incident light thereby generating an enhanced evanescent field at the surface of the one or multiple sensing regions; or

b) coherent and linearly polarized light incident on said platform is diffracted into individual beams or diffraction orders which interfere resulting in almost total extinction of the transmitted beam and an abnormal high reflection of the incident light thereby generating an enhanced evanescent field at the surface of the one or multiple sensing regions,

wherein the enhanced evanescent field interacts with luminescent material on or in the vicinity of one or more of the sensing regions so as to produce a detectable luminescent signal;

said apparatus further including means for generating a light beam and for directing the beam so that it is incident upon the platform on the side of the substrate having the optically transparent layer disposed thereon at an angle which causes evanescent resonance to occur in at least one sensing region of the platform to thereby create an enhanced resonant field in the at least one sensing region of the platform, and means for detecting a characteristic of an affinity reaction occurring on or in the vicinity of, or a characteristic of a material disposed on or in the vicinity of, the at least one sensing region of the platform.

33. (Previously Presented) Apparatus according to claim 32, wherein the light generating means comprises a laser for emitting a coherent laser beam.

34. (Previously Presented) Apparatus according to claim 33, wherein the means for directing the beam includes optical elements for directing the laser beam so that it is incident on the platform at an angle θ, the angle θ being defined by the expression $\sin\theta = n - \lambda/\Lambda$ where Λ is a period of the diffractive grooves, λ is the wavelength of the light and n is the effective refractive index of the optically transmitting layer.

35. (Previously Presented) Apparatus according to claim 32, wherein the detecting means is arranged to detect luminescence such as fluorescence, phosphorescence, chemi-luminescence, and electro-luminescence.

36-39. (Canceled)

40. (Previously Presented) The platform of claim 1, wherein the grooves of at least one of said corrugated structures are configured such that the radiation loss coefficient of the incident light within the at least one corrugated structure is on the order of 2000/cm or greater.

41. (Previously Presented) The platform of claim 1, wherein the grooves of at least one of said corrugated structures are configured such that the propagation distance of the incident light within the at least one corrugated structure is less than about 100 μm.

42. (Previously Presented) The platform of claim 1, wherein the grooves of at least one of said corrugated structures are configured such that the propagation distance of the incident light within the at least one corrugated structure is less than about 10 μm.

43-44. (Canceled)

45. (Previously Presented) The platform of claim 1, wherein the luminescent signal is one of a fluorescent signal, a phosphorescent signal, a chemi-luminescent signal and an electro-luminescent signal.

46. (Previously Presented) The platform of claim 1, wherein the luminescent material includes one of a fluorescent material, a phosphorescent material, and two or more materials which interact to produce a luminescent signal.